# (19) World Intellectual Property Organization

International Bureau



### 

(43) International Publication Date 3 March 2005 (03.03.2005)

**PCT** 

## (10) International Publication Number WO 2005/019875 A2

(51) International Patent Classification7:

G<sub>02</sub>B

(21) International Application Number:

PCT/US2004/027377

- (22) International Filing Date: 20 August 2004 (20.08.2004)
- (25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/497,223

22 August 2003 (22.08.2003) U

- (71) Applicant (for all designated States except US): STRATOS BIOSYSTEMS, LLC [US/US]; 2025 First Avenue, Market Place Tower PHB, Seattle, WA 98212 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): STOLOWITZ, Mark, L. [US/US]; 2025 First Avenue, Market Place Tower PHB, Seattle, WA 98212 (US).
- (74) Agent: LAURENCE, Kevin, B.; One Utah Center, 201 South Main Street, Suite 1100, Salt Lake City, UT 84111 (US).

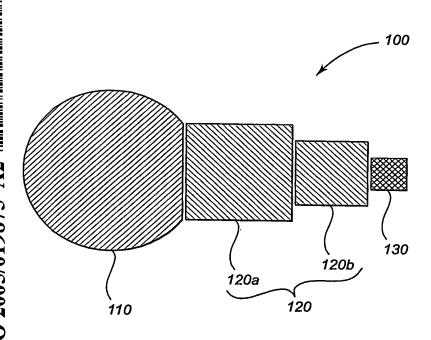
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

#### Published:

 without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ELECTROWETTING SAMPLE PRESENTATION DEVICE FOR MATRIX-ASSISTED LASER DESORPTION/ION-IZATION MASS SPECTROMETRY AND RELATED METHODS



(57) Abstract: Electro-wettable sample presentation devices in performing analytical measurements such as the detection of analytes contained within a liquid sample drop. The device comprises a virtual microwell for receiving a liquid sample drop; one or more intermediary electro-wettable at least one of which is contiguous to the microwell; and a terminal electro-wettable site which confines the deposition of analytes and matrix to within a predetermined area. The microwell is either an electro-wettable zone or a chemically-modified zone which exhibits either hydrophobic and non-adsorptive properties with respect to analytes, or hydrophobic and adsorptive properties with respect to analytes. Each of the electro-wettable sites modifies the surface of the sample presentation device between hydrophobic and hydrophilic states in response to an electrical potential

applied between a liquid sample drop and the electro-wettable site so as to direct the positioning of the liquid sample drop.

#### (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

#### (19) World Intellectual Property Organization International Bureau





(43) International Publication Date 3 March 2005 (03.03.2005)

PCT

### (10) International Publication Number WO 2005/019875 A3

- (51) International Patent Classification<sup>7</sup>: GOIN 1/10, 1/18, 30/02, 33/53, BOID 15/08
- (21) International Application Number:

PCT/US2004/027377

- (22) International Filing Date: 20 August 2004 (20.08.2004)
- (25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/497,223

22 August 2003 (22.08.2003) US

- (71) Applicant (for all designated States except US): STRATOS BIOSYSTEMS, LLC [US/US]; 2025 First Avenue, Market Place Tower PHB, Seattle, WA 98212 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): STOLOWITZ, Mark, L. [US/US]; 2025 First Avenue, Market Place Tower PHB, Seattle, WA 98212 (US).
- (74) Agent: LAURENCE, Kevin, B.; One Utah Center, 201 South Main Street, Suite 1100, Salt Lake City, UT 84111 (US)
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FT, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

#### Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report: 26 January 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ELECTROWETTING SAMPLE PRESENTATION DEVICE

(57) Abstract: Electro-wettable sample presentation devices are useful in performing analytical measurements such as the detection of analytes contained within a liquid sample drop. The device comprises a virtual microwell for receiving a liquid sample drop; one or more intermediary electro-wettable sites at least one of which is contiguous to the microwell; and a terminal electro-wettable site which confines the deposition of analytes and matrix to within a predetermined area. The microwell is either an electro-wettable zone or a chemically-modified zone which exhibits either hydrophobic and non-adsorptive properties with respect to analytes, or hydrophobic and adsorptive properties with respect to analytes. Each of the electro-wettable sites modifies the surface of the sample presentation device between hydrophobic and hydrophilic states in response to an electrical potential applied between a liquid sample drop and the electro-wettable site so as to direct the positioning of the liquid sample drop.

